RULES
OF
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER SUPPLY

CHAPTER 1200-4-9
WATER WELL LICENSING REGULATIONS AND WELL CONSTRUCTION STANDARDS

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1200-4-9-.01 DEFINITION OF TERMS. The following terms as used in this Chapter shall have the following meanings, unless the context clearly indicates otherwise:

(1) "Abandoned well" means any well that has permanently been discontinued from further use. A well shall be declared abandoned when the pump has been disconnected or removed for reasons other than repair or replacement or when the well is in such a state of disrepair that continued use for the purpose intended is impracticable.

(2) "Abandonment" means the act of properly sealing an abandoned well.

(3) "Act" means the Water Wells Act of 1963 as amended (T.C.A. *69-11-101 et. seq.)*

(4) "Animal pen" means an enclosed area one-half (1/2) acre or less where ten or more animals congregate for feeding and watering where vegetation or ground cover has been destroyed or is missing and the area is covered with manure or mud.

(5) "Aquifer" means a geologic formation, a group of such formations, or a part of a formation that will yield usable quantities of water to wells.

(6) "Artesian" means ground water confined under sufficient hydrostatic pressure to rise above the aquifer containing it.

(7) "Beneficial Use" means application of a resource to a purpose that produces economic or other benefits, tangible or intangible, economic or otherwise, such as procurement of water for domestic, industrial, or agricultural use or for a municipal water supply.

(8) "Bentonite" means a clay derived from volcanic ash consisting of at least 85% sodium montmorillonite. Bentonite is available in the following forms:

(a) "Bentonite granules" means 8 mesh pure bentonite, without additives.

(b) "Bentonite pellets" means commercially manufactured tablets made by compressing pure bentonite, without additives, into forms greater than 1/4 inch in size.

(c) "Bentonite chips" means commercially processed angular fragments of pure bentonite without additives.

(Rule 1200-4-9-.01, continued)

(9) "Board" means the Tennessee Ground Water Management Board or its successor, unless otherwise indicated.

(10) "Borehole" means the cylindrical opening created by the action of a drill or auger as it penetrates the subsurface.

(11) "Casing" means pipe or tubing, constructed of specified materials and having specified dimensions and weights, that is installed in a borehole during or after completion of the borehole to support the side of the hole and thereby prevent caving, to allow completion of the well, to prevent formation material from entering the well, and to prevent entry of undesirable water into the well.

(12) "Certificate" means a written or printed statement or decal issued by the department to the licensee which assigns a license number and license type to the license holder.

(13) "Commissioner" means the Commissioner of the Department of Environment and Conservation, his duly authorized representative and, in the event of his absence or a vacancy in the office of Commissioner, the Deputy Commissioner.

(14) "Completion date of well" means thirty days after the drilling equipment leaves or is removed from the well site.

(15) "Completion of drilling" means thirty days after the drilling equipment leaves or is removed from the well site.

(16) "Consolidated rock" means rock that is firm and coherent, solidified or cemented, such as granite, gneiss, limestone, slate or sandstone, which has not been decomposed by weathering.

(17) "Contamination" means the act of introducing into water foreign materials of such nature, quality, and quantity as to cause degradation of the quality of the water.

(18) "Department" means the Department of Environment and Conservation.

(19) "Director" means the Director of the Tennessee Division of Water Supply.

(20) "Domestic use" means the use of water for drinking, bathing, or culinary purposes.

(21) "Driller" means any person who manages or supervises the digging, drilling, or redrilling of a water well.

(22) "Employee" means a person hired by the license holder under this Act to work for wages or salary where the license holder has submitted for such person, an income tax withholding form to the Internal Revenue Service or a notarized affidavit of supervision.

(23) "Grout" means a stable, impervious, minimum shrinkage bonding material that is capable of producing a water tight seal required to protect against the intrusion of contamination.

(24) "Installation of pumps" means the procedure employed in the placement and preparation for operation of pumps and pumping equipment, including all construction involved in making entrances to the well and establishing seals.

(25) "Installer" means any person who installs or repairs water well pumps or who installs filters or other water treatment devices on ground water sources.

(Rule 1200-4-9-.01, continued)

(26) "Liner casing" means pipe that is installed inside a completed and cased well for the purpose of sealing off undesirable water or for repairing ruptured or punctured casing or screens.

(27) "Log" means a record of the geologic formation(s) penetrated in the drilling of a water well.

(28) "Overburden" means unconsolidated earth material that overlies consolidated rock material.

(29) "Person" means any individual, group, partnership, association, organization, corporation or any combination of them.

(30) "Pit" means a cavity or hole in the ground, the bottom of which is below the level of the surrounding turf.

(31) "Pitless Adapter" or "pitless unit" means a device specifically manufactured for the purpose of allowing a below-ground lateral connection between a well and its plumbing appurtenances.

(32) "Potable water" means water that is not brackish or saline and does not contain total coliform bacteria or chemical constituents in such quantity or type as to render the water unsafe, harmful or generally unsuitable for human consumption.

(33) "Production of water" means withdrawing water from the ground for the purposes of locating, testing, evaluating or developing a groundwater supply from any aquifer for beneficial use.

(a) Wells for the production of water include, but are not limited to, the following:

1. Borings that are used to locate, divert, withdraw, develop or manage ground water supplies for beneficial uses;

2. Test holes drilled to determine the availability of water supplies for beneficial uses; and

3. Wells drilled to supply water for ground coupled heat pumps and air conditioners

(b) The following are not wells for the "production of water" as used in these rules.

1. Post holes;

2. An excavation for the purpose of obtaining or prospecting for oil, natural gas, minerals other than water, products of mining and quarrying;

3. Injection wells regulated under Chapter 1200-4-6 of the rules of the Water Quality Control Board;

4. Cathodic protection wells;

5. Wells used for dewatering purposes in construction work;

6. Monitor wells, geographical test borings and piezometers that are regulated by rules of the Water Quality Control Board or otherwise by the Department;

7. Ponds, pits, sumps and drainage trenches; and

8. Contaminant recovery wells otherwise regulated by the Department.

(Rule 1200-4-9-.01, continued)

(34) "Pumps and pumping equipment" means any equipment or materials utilized or intended for use in withdrawing or obtaining ground water, including well seals.

(35) " Recovery well" means any well constructed for the purpose of removing contaminated groundwater or other liquids from the subsurface.

(36) "Repair" means work involved in deepening, reaming, sealing, installing, or changing casing depths, perforating, screening, or cleaning, acidizing, or redevelopment of a well excavation, or any other work which results in breaking or opening a well seal.

(37) "Standard Dimension Ratio (SDR)" means the quotient obtained when the outside diameter of thermoplastic well casing is divided by the wall thickness.

(38) "Static water level" means the level at which the water stands in the well when the well is not being pumped and is expressed as the distance from a fixed reference point to the water level in the well.

(39) "Supervision" means the act of directing and managing full or part time unlicensed employees engaged in the business of constructing wells, or installing pumps or installing water treatment devices on wells .

(40) "Well" or "water well" means a hole drilled, redrilled or dug into the earth, by boring or otherwise, for the production of water.

(41) "Well construction" means all acts necessary to construct a well for the production of water including, but not limited to the location and excavation of the well; placement of casings, screens and fittings; development and testing.

(42) "Well development" means the procedures used to remove mud or fine material from the drilled borehole, to correct any damage to the aquifer that occurred during drilling and improve the water passageways into the well from the aquifer.

(43) "Well driller" or "water-well contractor" means an individual, firm or corporation engaged in the business of constructing wells.

(44) "Wellhead" means the upper terminal of the well including adapters, ports, valves, seals, and other attachments.

(45) "Well seal" means an approved arrangement or device used to cap a well or to establish and maintain a junction between the casing of a well and the piping or equipment installed therein, the purpose or function of which is to prevent pollutants from entering the well at the upper terminal.

Authority: *T.C.A. §§4-5-201 et seq., 69-11-106, and 69-11-107.* ***Administrative History:*** *Original rule filed February 21, 1990; effective April 7, 1990. Amendment filed June 21, 1993; effective August 5, 1993. Amendment filed October 12, 1998; effective December 26, 1998.*

1200-4-9-.02 REQUIREMENTS. After the effective date of this regulation, applicants for driller's and installer's licenses shall meet the following requirements to qualify for licensing under the Act:

(1) Be at least 18 years of age;

(2) Have a minimum of two (2) years experience, prior to the date of application, working in the occupation for which a license is being sought;

(Rule 1200-4-9-.02, continued)

(3) Complete grade 10 in high school or submit proof of equivalent achievement demonstrated by successful completion of approved short courses or written examinations. Up to four years of full-time employment may be substituted for equal years of education. This shall be in addition to the experience requirements in paragraph (2); and

(4) Pass an examination as prescribed by the Board.

Authority: *T.C.A. §§4-5-201 et seq., 69-11-106(1), and 69-11-107(d).* ***Administrative History:*** *Original rule filed February 21, 1990; effective April 7, 1990. Amendment filed October 12, 1998; effective December 26, 1998.*

1200-4-9-.03 SATISFACTORY PROOF OF EXPERIENCE. Satisfactory proof of experience shall consist of either of the following methods.

(1) A list of ten (10) wells the applicant has constructed or worked on during a minimum of the last two years prior to the date of making the application for a license. The information shall include for each well the following:

(a) Name and address of the owner or owners of each well;

(b) Location and intended use of each well;

(c) Major construction features such as depth, type of casing, backfill, yield and water quality;

(d) Date of completion; and

(e) Work done by applicant and approximate customer cost.

(2) Copies of occupational licenses or certificates covering two years and indicating that the applicant has been engaged in the occupation for which a license is being sought.

Authority: *T.C.A. §§4-5-201 et seq., 69-11-106(1), and 69-11-107(d).* ***Administrative History:*** *Original rule filed February 21, 1990; effective April 7, 1990.*

1200-4-9-.04 APPLICATIONS.

(1) All applications for licensing shall be submitted to the Director on the form prescribed by the Board and provided by the office of the Director.

(2) An application will not be accepted for processing unless the application is complete, accompanied by the fee required by the Act, and signed by the applicant.

(3) No fee received with an application will be returned. This includes the fee received from an applicant who fails to pass an examination or meet the requirements of Rule 1200-4-9-.02 (1),(2) and (3).

(4) The corporation, partnership or other entity application must be signed by an individual who has clear authority to direct and supervise the applicant's activities for which a license is being sought. For the purposes of this rule, " clear authority" shall mean:

(a) For a corporation, a responsible corporate officer such as president, secretary, treasurer, vice president or manager of the division or function responsible for the activities for which a license is being sought,

(b) For a partnership, a general partner,

(Rule 1200-4-9-.04, continued)

(c) For a sole proprietorship, the proprietor; and,

(d) For any other organization or group, either a principal executive officer or elected official.

(5) The individual who signs the application must meet the requirements of Rule 1200-4-9-.02 and 1200-4-9-.05 (1).

(6) Applicants who do not meet the requirements of Rule 1200-4-9-.02(1), (2) and (3) will be notified that their application has been denied and the reasons therefor.

(7) Any person whose application has been denied may request in writing to the Director within thirty (30) days of receipt of the letter of denial, an informal meeting with the Director for the purpose of explaining, or supplementing the application. Based on the person's explanation, the Director may accept the application for processing.

(8) An applicant whose application has been denied may not file a new application for a period of sixty (60) days following the date of the letter of denial. The new application may be filed as either an original application or in the form of a supplement to the prior application. In either case, the application fee shall accompany the new application.

Authority: *T.C.A. §§4-5-201 et seq., 69-11-106(1), and 69-11-107(d).* ***Administrative History:*** *Original rule filed February 21, 1990; effective April 7, 1990. Amendment filed October 12, 1998; effective December 26, 1998.*

1200-4-9-.05 EXAMINATIONS.

(1) All applicants who meet the requirements of rule 1200-4-9-.02(1), (2) and (3) will be required to take a written examination and thereafter appear before the Board for an interview.

(2) Written examinations to be given to applicants shall be approved by the Board.

(3) All applicants admitted to the written examination will be required to take a general examination on ground water hydrology. In addition, each applicant will be required to take one or more specialty examinations designed to test the competence and ability of the applicant to perform the work of a driller or installer. The specialty examinations may include but are not limited to the following:

(a) For Driller applicants:

1. Cable tool drilling;

2. Air rotary drilling;

3. Mud rotary drilling;

4. Boring and augering; and

5. Jetting and driving wells.

(b) For Installer Applicants:

1. Pump installation - domestic;

2. Pump installation - commercial;

3. Pump installation - industrial and municipal; and

4. Installation of filters and water treatment devices.

(4) Examinations shall be offered at least four times annually in a manner and at a time and place prescribed by the Director. Each examination shall be monitored by such person(s) as may be designated by the Director, or by one or more members of the Board. No persons, other than members of the Board, monitors, and examinees will be permitted in the room while the written examination is being administered.

(5) The grade scored by each applicant on the written examination shall be posted in the space provided upon the examinee's application form. Each applicant will be notified of his or her grade scored on the examination by first-class mail, sent to the address appearing on the application.

(6) A minimum grade of fifty (50) percent on the general and seventy (70) percent on any other speciality exam category is required to pass the written exam, and be eligible for an interview with the Board.

(7) A person failing an examination may apply for reexamination the next time examinations are offered by the Department, but no sooner than sixty (60) days from the date of the previous examination.

(8) Interviews of applicants will be conducted before at least three members of the Board. Questioning by individual Board members will be concerned with the quality and quantity of the applicant's experience including but not limited to the following:

(a) Where and when it was obtained;

(b) Types of equipment used;

(c) What was the applicant's level of responsibility;

(d) Familiarity of the applicant with addressing problems such as:

1. muddy wells;

2. lost circulation;

3. borehole collapse;

4. crooked borehole;

(e) Knowledge of State well construction standards; and

(f) Responsibilities of licensees to the well owner and the Department.

(9) Based on the applicant's answers to the questions in the interview, each Board member will vote for or against issuance of a license to the applicant. An applicant must receive a passing vote from a majority of the quorum present to be recommended for licensing.

(10) Applicants who pass both the written exam and interview with the Board will be recommended for licensing.

Authority: *T.C.A. §§4-5-201 et seq., 69-11-106(1), and 69-11-107(d).* ***Administrative History:*** *Original rule filed February 21, 1990; effective April 7, 1990. Amendment filed October 12, 1998; effective December 26, 1998.*

1200-4-9-.06 LICENSES.

(1) Issuance. An applicant recommended by the Board and approved by the Commissioner shall be issued a license to engage in the type of business for which he has applied and has demonstrated a satisfactory level of competency to perform.

(a) Driller applicants shall be issued one of three classes of licenses as follows:

1. A Class A driller's license shall be issued to an applicant who demonstrates a satisfactory level of competence to manage, supervise or otherwise engage in the business of constructing, developing, deepening, reworking and plugging water wells using conventional well drilling equipment.

2. A Class AA driller's license shall be issued to an applicant who, in addition to meeting the requirements for a Class A driller's license, demonstrates a satisfactory level of competence to manage, supervise or otherwise engage in the business of installing, servicing and repairing water well pumps.

3. A Class AAA driller's license shall be issued to an applicant who, in addition to meeting the requirements for a Class AA driller's license, demonstrates a satisfactory level of competence to manage, supervise or otherwise engage in the business of installing, servicing and repairing filters and water treatment devices for use on water wells.

(b) Installer applicants shall be issued one of three types of licenses as follows:

1. A Type I installers license shall be issued to an applicant who demonstrates a satisfactory level of competence to manage, supervise or otherwise engage in the business of installing, servicing and repairing water well pumps for use in withdrawing or obtaining ground water.

2. A Type II installers license shall be issued to an applicant who, in addition to meeting the requirements for a Type I installer license, demonstrates a satisfactory level of competence to manage, supervise or otherwise engage in the business of installing, servicing and repairing filters and water treatment devices for use on water wells.

3. A Type III installers license shall be issued to an applicant who demonstrates a satisfactory level of competence to manage, supervise or otherwise engage in the business of installing, servicing and repairing filters and water treatment devices for use on water wells.

(c) The initial certificate to be issued to a licensed driller or installer shall be nontransferable and suitable for framing. It shall contain the name of the licensee, type or class of license, date of issuance, expiration date, license number and signatures of the Director and Commissioner. A wallet-sized card bearing similar information will be issued with the certificate and shall be carried on the person of the licensee whenever engaged in the water well business.

(d) All licenses issued pursuant to these rules shall be valid for a period not to exceed one year and shall expire on July 31st following the date of issuance.

(e) Reciprocity to water well drillers and installers licensed in other states will be granted by the Department provided the applicant meets the requirements of the written exam as required under Rule 1200-4-9-.05, (6), the applicant is currently licensed and in good standing in that state and reciprocal privileges have been granted by that state to a licensee in Tennessee. An oral exam will not be required.

(Rule 1200-4-9-.06, continued)

(f) A licensee shall not allow any individual to operate under his license unless the individual to be supervised by the licensee is employed by the licensee and holds an installer or rig operator card. Proof of employment must be on file with the Department prior to commencement by the employee of any activities requiring supervision. Proof of employment shall consist of one of the following:

1. Federal W2 Form income tax withholding statement.

2. Workers compensation insurance record.

3. Employee payroll record showing tax withholding.

4. Paycheck stubs showing tax withholding.

5. Notarized Affidavit of Supervision.

(g) All persons licensed by the department under these rules shall keep the department advised of their current address and must readily accept all mail sent to them by the department.

1. The department shall be notified of any change of address within thirty (30) days of change.

2. For purposes of these rules, registered or certified mail sent with proper postage to the licensee's last known address shall be considered adequate notification regardless of whether it is accepted or returned unclaimed.

3. Because of the department's duty to supervise licenses and because written communication is a necessary aspect of such supervision, a licensee's refusal to accept mail or failure to claim registered or certified mail is a violation of these regulations and may result in enforcement action.

(2) Renewal. Before a license can be renewed, a license holder in good standing must file an application for renewal on a form made available by the Director and submit with the completed application the annual fee as specified in the Act.

(a) Upon approval of the Commissioner a renewal license will be issued for a period not to exceed one year.

(b) A renewal certificate shall consist of a wallet-sized card in duplicate containing at least the name of the license, type or class of license, license number, expiration date and signature of the Commissioner. One section of the card shall be kept with the original license certificate and the duplicate shall be carried on the person of the licensee whenever engaged in the water well business.

(c) If the application and fee for renewal of a licensee is not received by the Director by the date of expiration, that license cannot be renewed and the license holder must file a new application to obtain a valid license.

(d) A duplicate license to replace any lost, destroyed or mutilated license will be issued by the Director upon receipt of written request from the licensee and a payment of fifteen dollars ($15.00) to cover the cost of reissuance.

(e) If a licensee's employees will at any time be in charge of well construction or pump installation in the absence of the licensee, he shall request the Director to issue a wallet-sized identification

card for them. This card shall bear the name of the employee to whom it is being issued and the signature and license number of the licensee under whose supervision the work is being performed. The card shall be carried by the licensee's employee at all times at the work site.

(f) A decal shall be issued for identification purposes for each drilling rig and service vehicle registered by a well drilling contractor or pump installer. The decal shall be prominently displayed where it can be seen at all times from outside the vehicle.

(g) Decals furnished for drilling rigs and service vehicles are not transferable. The decals shall be removed and destroyed when a drilling rig or service vehicle is sold, traded or otherwise disposed of. A new decal for a newly acquired drilling rig or service vehicle will be provided without cost upon receipt of a written notice of acquisition of a different drilling rig or service vehicle.

(h) All rigs and commercial vehicles used by well drillers and installers shall be permanently and prominently marked on the driver side door of the rig or vehicle for easy identification with name of the person, firm or corporation, and letters "TN Lic" with the appropriate well driller or installer license number. The letters and numerals shall be bold in print, on a background of contrasting color, and not less than two (2) inches in height.

(i) If the application and renewal fee are not received by the Director by the date of expiration, the license shall expire. Expired licenses may be reissued without examination or board appearance if the renewal fee and application are submitted within twelve (12) months of the date of expiration, and no additional monies are owed to the department.

(j) A person shall not cause any word or words to be used in any contract, business form, document, sign, display, or other advertising medium in Tennessee which indicate or imply that a person, firm, partnership, or corporation is engaging in the business of well drilling, pump installation or water treatment unless that person, firm, partnership, or corporation is currently licensed to conduct such an activity in the State of Tennessee.

Authority: *T.C.A. §§4-5-210 et seq., 69-11-103(a)(2), 69-11-106(1), and 69-11-107(d).* ***Administrative History:*** *Original rule filed February 21, 1990; effective April 7, 1990. Amendment filed October 12, 1998; effective December 26, 1998.*

1200-4-9-.07 SUSPENSION AND REVOCATION.

(1) The Commissioner shall suspend or revoke a license or refuse to issue or renew a license if he finds that the applicant for or holder of such license:

(a) has intentionally made a material misstatement in the application for such license;

(b) has willfully violated any provision of the Act or any rule or regulation promulgated pursuant thereto;

(c) has obtained or attempted to obtain, such license by fraud or misrepresentation;

(d) has been guilty of fraudulent or dishonest practices; or

(e) has demonstrated a lack of competence as a driller of water wells or as an installer.

(2) A holder of a license certificate which has been revoked in accordance with this rule, after a waiting period of not less than one (1) year after the license certificate was revoked, may petition the Commissioner for a hearing for reinstatement of his license.

(3) Upon suspension or revocation of a license, the Commissioner may with advice from the Board, impose such terms and conditions as in his judgment shall be considered just.

(4) Any person whose license is suspended or revoked shall not perform the duties of a well driller or pump installer in the State of Tennessee, or work under the supervision of a licensed driller or installer.

(5) The Board may recommend reissuance of a license to any person whose license has been revoked upon written application to the Board by the applicant, showing good cause to justify such reissuance.

Authority: *T.C.A. §§4-5-201 et seq. and 69-11-105.* ***Administrative History:*** *Original rule filed February 21, 1990; effective April 7, 1990.*

1200-4-9-.08 ROLE OF COMPLAINTS IN ENFORCEMENT DECISIONS RELATED TO LICENSEES.

(1) In making determinations as to whether to issue an order for corrective action, a penalty assessment, or a license revocation, the Commissioner may utilize information obtained from complaints by any persons.

(2) The Board may utilize its expertise to evaluate any complaints received from the public. The Board may then make a recommendation to the Commissioner as to what enforcement options are appropriate.

(3) In reaching these conclusions about enforcement action, the Commissioner and the Board may, in addition to any other investigation conducted by the Division, interview both the complainant and the licensee who is the subject of the complaint.

(4) If a licensee takes action to correct any violation of the Act or rules that is the subject of a complaint, such action and the degree of the effectiveness of the action are factors to be considered by the Commissioner and the Board in their decisions regarding appropriate enforcement action.

Authority: *T.C.A. §§4-5-201 et seq., 69-11-106(2), (3), and (4), and 69-11-107(a) and (d).* ***Administrative History:*** *Original rule filed February 21, 1990; effective April 7, 1990.*

1200-4-9-.09 APPEALS.

Any person whose application is denied for any reason may request a review of the denial in accordance with the provisions of the Uniform Administrative Procedures Act (T.C.A. Section 4-5-101 et seq.) by filing that request with the Commissioner within thirty (30) days of receipt of the denial.

Authority: *T.C.A. §§4-5-201 et seq. and 69-11-110(j).* ***Administrative History:*** *Original rule filed February 21, 1990; effective April 7, 1990.*

1200-4-9-.10 WELL CONSTRUCTION STANDARDS.

These rules will apply solely to wells constructed for the production of water from underground sources and have no application to wells constructed for quarry blast holes or mineral prospecting, or any purpose other than production of water.

(1) Requirements

(a) No person shall construct, reconstruct, or repair, or cause to be constructed, reconstructed or repaired any water well; nor shall any person install, repair, or cause to be installed or repaired any pump, pumping equipment, water filter or water treatment device to be used on a water well

except in accordance with the provisions of the Water Wells Act (T.C.A. 69-11-101 et seq.) and these rules.

(b) Every well driller, within thirty (30) days after completion of a water well, shall submit a report on the construction or reconstruction of the well to the Department. The well completion report shall be made on a form provided by the Department or a reasonable facsimile approved by the Department.

(c) For each water well completed in Tennessee after the effective date of this rule, a one-time registration/inspection fee of seventy five dollars ($75.00) shall be paid to the Department by the driller or contractor who supervised the drilling of the well.

1. The fee shall be submitted to the Department by the driller at the time of submission of the well completion report.

2. The amount of the registration/inspection fee shall be reviewed annually by the Board and their recommendations for adjustment of the fee shall be presented to the Commissioner for final action.

3. The requirement of payment to the Department of a one-time registration/inspection fee shall not apply to water wells drilled in any local jurisdiction which is authorized, by private act or pursuant to the provisions of an adopted “home rule” charter, to regulate the location and construction of water wells and which has established a fee for the inspection of water wells.

4. The payment to the department of a registration/inspection fee shall not apply to any replacement well drilled for a single family residence where an inspection/ registration fee has been paid within the last five years. The driller must identify on the driller’s report that the well is a replacement well and the tag number of the well it replaces.

5. The requirement of payment to the Department of a one time registration/inspection fee shall not apply to any existing water well that is reworked or deepened provided the driller can supply the Department with adequate documentation of the well’s existence prior to its reworking. The driller must also denote that the well has been reworked or deepened on the driller’s report.

(d) When strict compliance with these standards is impractical, the driller or installer shall make application to the Department for approval of equivalent alternative standards (a variance) prior to the work being done. The Department may grant the request for a variance based on if it determines the proposed standards offer an equivalent or higher level of protection to the environment. In an emergency or in exceptional instances, the Department will respond to a verbal request provided the applicant submits a written application within ten (10) days of the verbal application.

(e) Water wells abandoned as prescribed in Rule 1200-4-9-.16 will not require the seventy five ($75) dollar fee as long as the driller submits an abandonment report within sixty (60) days from the date of abandonment.

(f) Every well driller, within sixty (60) days of abandonment of a water well, shall submit a report of the abandonment of the well to the department. The well abandonment report shall be made on a form provided by the department or a reasonable facsimile approved by the department. The report shall include the same information as required on the completion report and shall include specific information on how the well was abandoned and the placement and type of

backfill placed in the well bore. The abandonment report shall be signed by the licensed well driller.

(2) Location

(a) The construction of a water well is prohibited at other than a safe distance from any known potential source of contamination. The minimum safe distances shown in Table A shall apply for the sources of contamination listed therein:

(b) A water supply well may be constructed in an area subject to flooding provided the top of the water tight casing extends not less than two (2) feet above the one hundred (100) year flood plain.

(c) Relation to buildings, pits, and basements:

1. A well located adjacent to a building shall be so located that the center line of the well extended vertically will clear any projection from the building by not less than five (5) feet.

2. New wells shall not be constructed in pits or basements.

(d) New wells shall not be located closer than ten (10) feet from a property line. New wells located from ten (10) feet to twenty-five (25) feet from a property line shall require a minimum of thirty-five (35) feet of casing installed below land surface with impervious material such as cement grout or bentonite chips, tablets or bentonite grout backfilled in the annular space to a depth of thirty-five feet.

TABLE A

MINIMUM DISTANCES TO SEPARATE WATER WELLS FROM POTENTIAL SOURCES OF CONTAMINATION

SOURCES OF CONTAMINATION	MINIMUM DISTANCES
Animal pens or feed lots	100 feet
Leaching Pits; sewage lagoons	200 feet
Pit Privys	75 feet
Sewer lines	50 feet
Sludge and septage disposal sites	100 feet
Septic tanks and drain fields	50 feet
House to septic tank connections, if the line is tight	10 feet

(3) Source of Water Supply

(a) The source of water for any well shall be at least nineteen (19) feet below the surface of the ground.

1. In the event that no other ground water source is available, a source of less than nineteen (19) feet deep may be developed provided that:

(i) Prior to the installation of the casing in the well, the Division of Water Supply Central Office is notified by phone regarding:

(I) County and street address of the well

(II) Name and phone number of the well owner

(III) Street address of owner if different from address of the well

(ii) A minimum of ten (10) feet of casing is installed below ground surface.

(iii) The well is sealed from land surface to a minimum ten (10) feet below ground with either cement grout or bentonite.

(iv) The owner of the well is advised by the driller concerning the development of a water bearing zone less than nineteen (19) feet deep by sending a written report to the homeowner and to the Division, at the time the completion report is submitted, containing the following advisory:

(I) The owner may need to place a chlorinator on the well to treat the water for potential problems with microbiological contamination.

(II) A shallow water bearing zone may be more subject to surface contamination surrounding the well and the well yield may diminish over time.

(III) The homeowner should provide a copy of the report and disclaimer to any prospective buyer prior to any resale of the property where the well is located.

(b) The driller shall develop the most favorable water-bearing zone(s) and seal off any source(s) of less desirable quality.

(c) It shall be the duty of any person attempting to construct a water well to seal off salt water, oil, gas, or any other fluid or material which might contaminate a source of fresh water.

(4) Drilling Fluids

(a) Water used during the initial construction of a water well shall be obtained from a public water supply, water well or protected springbox. If additional water is required to complete the construction of the well, the driller shall use water from the best available source near the drill site. In the event that water from a public water supply, water well or protected springbox is not available within a three mile radius of the drill site, the driller may obtain water directly from a surface supply other than a farm pond, open ditch or lagoon.

1. The best source, in order of preference shall be:

(i) A public water supply;

(ii) An existing water well or protected springbox; or

(iii) A surface source other than a farm pond, open ditch, or waste lagoon.

(b) All water used from a public water supply, well or springbox shall also be treated with enough liquid bleach or hypochlorite granules to retain a free chlorine residual of at least two parts per million (2 ppm).

(Rule 1200-4-9-.10, continued)

(c) All water from a surface source shall be dosed with a minimum of fifty parts per million (50) ppm of chlorine, i.e., two (2) gallons of sodium hypochlorite (laundry bleach, approximately five percent (5%) available chlorine) per one thousand (1000) gallons of drilling water.

(d) Surface water sources shall be free of mud, algae and other visible contaminants. Water from farm ponds, open ditches and lagoons shall not be used for drilling water.

(e) The driller shall denote on the report submitted to the Department if any surface water source water was used during the construction of the water well.

(f) Drilling fluids and additives shall be materials specified by the manufacturer for use in water well construction and approved by the Department.

(g) During the course of drilling a water well with air rotary equipment, a minimum of one (1) gallon of water per minute must be injected or added into the air stream. The amount of water injected shall be sufficient to control dust and to keep the hole cleaned out.

(h) The amount of rock drill oil used to lubricate down hole drilling hammers shall not exceed hammer manufacturer's recommendations. The oil used to lubricate the hammer shall be specifically designed for that purpose.

(i) Petroleum based products or byproducts spilled or leaked from a drill rig or pump truck in any quantity greater than five (5) gallons shall be immediately removed from the area within a twenty five (25) foot radius around the well by the driller or installer responsible for the spill.

(5) Casing

(a) Wells drilled for the production of water shall be cased with watertight casing extending from at least nineteen (19) feet below the land surface to a minimum of six (6) inches above land surface. For wells located in areas subject to flooding, see rule 1200-4-9-.10(2)(b). For water sources less than nineteen (19) feet deep see Rule 1200-4-9-.10 (3) (a).

1. The watertight casing in wells constructed to obtain water from a consolidated rock formation shall be firmly seated and sealed below all crevices that release inferior quality water or mud into the well or to a depth of at least five (5) feet below the top of the consolidated rock whichever is greater.

2. The watertight casing in wells constructed to produce water from an unconsolidated aquifer (such as saturated gravel or sand) shall extend at least to the top of the aquifer or to a depth of 19 feet which ever is greater.

(b) Except as otherwise specified in these regulations, the permanent well casing shall:

1. Casing shall be new or in like new condition. Such casing or pipe shall not be used unless free of leaks, corrosion, and dents; is straight and true, and not out of round, seamless or welded, black or galvanized steel pipe conforming to the weights and dimensions given in Table B and meeting the American Society for Testing and Materials (ASTM) Standards A53-87b or A589-85. Reject pipe shall not be used;

2. Have watertight joints that may be welded, or threaded and coupled; and

3. Be equipped with a drive shoe if the casing is to be driven.

(Rule 1200-4-9-.10, continued)

4. Pipe sizes that are not listed in Table B and are less than ten (10) inches in diameter shall match listed values as closely as possible.

5. Pipe sizes that are ten (10) inches in diameter or larger shall be Schedule 20 pipe as a minimum.

TABLE B

MINIMUM DIMENSIONS AND WEIGHTS FOR WATER WELL CASING

Diameters in inches		Minimum Wall Thickness	Weight in Pounds per Foot
External	Internal	in Inches	Plain Ends Only
3.500	3.250	0.125	4.51
4.000	3.732	0.134	5.53
4.500	4.216	0.142	6.61
5.500	5.192	0.154	8.79
6.000	5.672	0.164	10.22
6.625	6.255	0.185	12.72
8.625	8.249	0.188	16.90

(c) Thermoplastic well casing may be installed in wells constructed to obtain water from unconsolidated aquifers (such as saturated gravel, sand or overburden) provided:

1. The casing is new;

2. The casting meets or exceeds the requirements of ASTM Standard F-480-88 and bears the NSF (National Sanitation Foundation) seal in each section of casing;

3. The Standard Dimension Ratio (SDR) shall not exceed 26;

4. The casing is installed after the borehole has been drilled to the final depth of the finished well, and no additional drilling takes place after the casing has been installed; and

5. Joints shall be solvent cemented with a quick-setting cement, or threaded and coupled.

(d) In areas where the water is obtained from overburden above the consolidated rock surface, the casing shall be set at or just above the consolidated rock. A screen may be attached to the bottom of the casing or the lowermost few feet of the casing may be slotted or perforated to allow water to enter the well provided the top of the screen or the topmost perforation in the casing is at least 20 feet below land surface. The completed well shall be finished so that extraneous material such as sediment cannot enter the well.

(e) Water well casing shall extend a minimum of six inches above the finished land surface unless, site conditions dictate that the well head will be better protected below ground surface and the upper terminus is constructed in the following manner:

1. The casing is terminated just below ground surface in a watertight manhole cover.

2. The manhole cover lid and skirt shall be all cast steel or aluminum construction.

3. The manhole cover shall have a sufficient diameter to use a well cap below the manhole lid.

4. The manhole shall be secured by a concrete pad two inches thick and no less than 24 inches in diameter.

5. The manhole cover shall be equipped with a positive drain to an area where water cannot enter from flooding or where excessive runoff could back up through the drain to the well head. The drain may be located in the basement area of a house.

6. The manhole cover shall be clearly marked on the cover as a "water well".

7. Construction techniques for casings cut off below ground level shall conform to the drawing in figure 1.

BELOW GROUND SURFACE WELL HEAD CONSTRUCTION

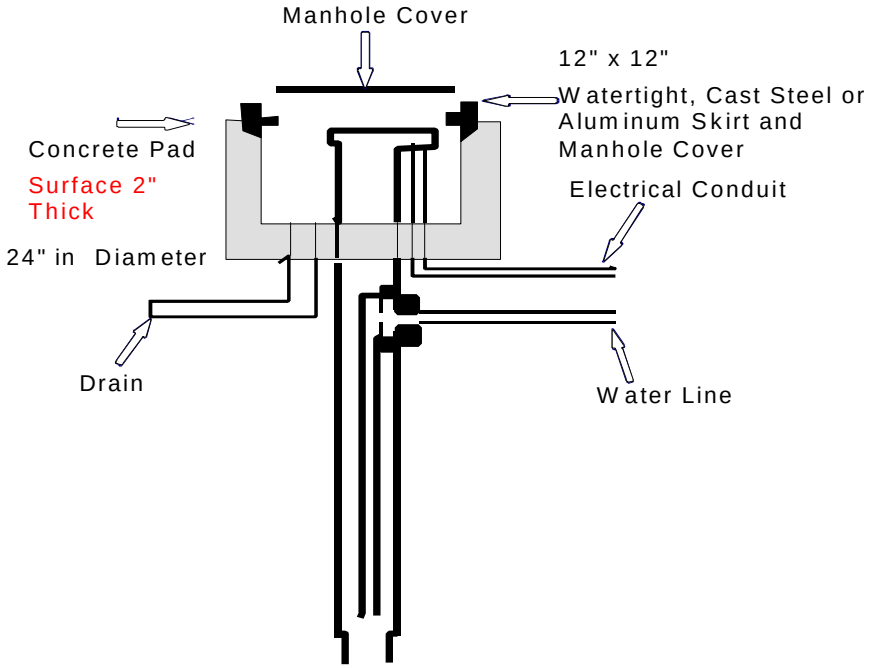

Figure 1

(f) The upper terminus of the well head shall be capped with a watertight well seal or cap specifically designed for capping the well.

(6) Backfilling and Grouting

(a) The grout material used in the backfilling or grouting of a water well shall consist of a mixture of Portland Class A cement or quick setting cement in a ratio of not over six (6.0) gallons of water per ninety-four (94) pound sack of cement, or a high solids mixing bentonite grout with a minimum of 20% solids and a weight of no less than nine and two tenths (9.2) pounds per gallon as measured by a standard mud balance. The use of bentonite, in chip or tablet form, ranging in size from one-quarter inch (1/4) to three-quarters of an inch (3/4) will be allowed as

an alternate seal to slurry grouting. The bentonite shall be mixed and applied in accordance with the manufacturer's recommendations. The use of low solids bentonite drilling clay designed for use as a drilling fluid to form a filter cake on the side walls of the borehole and to increase viscosity of water) is prohibited for use as a grout or sealing material except as an additive. Only bentonite grout, bentonite tablets, or bentonite chips approved by the National Sanitation Foundation (NSF) or American National Standards Institute (ANSI) certified parties as meeting NSF product standard 60 or 61 shall be approved by the Department as appropriate grouting or sealing material.

(b) For wells completed with either steel or plastic well casing, the annular space between the casing and borehole wall of the well from a depth of three (3) feet to ten (10) feet below land surface shall be backfilled with an impervious material of either cement grout or bentonite as defined in Rule 1200-4-9-.10 (6) (a) . The remaining annular space between the casing and borehole wall shall be backfilled with an impervious material or combination of materials such as cement, bentonite, sand, puddled clay or well cuttings. However, the department recommends that the remaining annular space between the casing and the borehole wall of the well to the bottom of the watertight casing, be filled with the same grout or sealing material used from three to ten feet.

(c) Placement of the backfill material shall be done in such a way that there are no bridges or gaps in the annulus. The top of the backfill material shall remain level with the land surface surrounding the well.

(d) If bentonite is used for backfill, it shall be placed in accordance with the manufacturer's recommendations. For example, the product "Holeplug" from Baroid requires the annular space in a well to be one and one half inches (1-1/2") in clearance or more when "Holeplug" three fourths inch (3/4") is used. The annular space must be a minimum of three fourths inch (3/4") in clearance in the event that "Holeplug" three eighths inch (3/8") bentonite is used.

(e) If cement-based grout is used for backfill, it shall be placed around the casing by <u>one</u> of the following methods:

1. Pressure

   The annular space between the casing and the borehole wall shall be a minimum of one and five-tenths (1.5) inches, and grout shall be pumped or forced under pressure through the bottom of the casing until it fills the annular space around the casing and overflows at the surface; or

2. Pumping

   The annular space between the casing and formation shall be a minimum of two (2) inches and grout shall be pumped into place through a pipe or hose extended to the bottom of the annular space which can be raised as the grout is applied, but the grout pipe or hose shall remain submerged in grout during the entire application; or

3. Other

   The annular space between the casing and the borehole wall shall be a minimum of three (3) inches and the annular space shall be completely filled with grout by any method that will insure complete filling of the space, provided the annular area does not contain water or other fluid. If the annular area contains water or other fluid, it shall be evacuated of fluid or the grout shall be placed by the pumping or pressure method.

(7) Well Screens

(a) Any water well finished in an unconsolidated rock formation shall be equipped with a screen or perforated pipe that will adequately prevent the entrance of soil or formation material into the well after the well has been developed and completed by the well contractor.

(b) The well screen shall:

1. Be of steel, stainless steel, plastic or other Department approved material and shall be of a strength to satisfactorily withstand chemical and physical forces applied to it during and after installation;

2. Be of a design to permit optimum development of the aquifer with minimum head loss consistent with the intended use of the well;

3. Have openings designed to prevent clogging and shall be free of rough edges, irregularities or other defects that may accelerate or contribute to corrosion or clogging; and

4. Be provided with such fittings as are necessary to seal the top of the screen to the watertight casing and to close the bottom. If the screen is installed through the casing, a packer, seal or other approved design shall be used to prevent the entry of ground water into the well through any openings other than the screen.

(c) Multi-screened wells shall not connect aquifers or zones which have differences in:

1. Water quality to the extent that intermixing of the waters would result in deterioration of the water quality in any aquifer or zone.

2. Static water levels that would result in depletion of water from any aquifer or zone, or significant loss of head in any aquifer or zone.

(8) Gravel-Packed Wells

(a) In constructing a gravel-packed well:

1. The gravel shall be composed of quartz, granite, or similar rock material and shall be clean, rounded, uniform, water-washed and free from clay, silt, or other deleterious material.

2. The gravel shall be placed in the annular space around the screens and casing by any method that will insure accurate placement and avoid bridging or segregation.

3. The gravel pack shall have a minimum thickness of at least two (2) inches and shall not extend more than ten (10) feet above the top of the screen or perforated pipe.

4. The gravel shall be disinfected using water with a free chlorine residual of at least 50 parts per million (ppm).

(b) The gravel pack shall not connect aquifers or zones which have differences:

1. In water quality that would result in deterioration of the water quality in any aquifer or zone.

2. In static water levels that would result in depletion of water from any aquifer or significant loss of head in any aquifer or zone.

(9) Large Diameter Wells

(a) Large-diameter bored or augered wells may be cased with concrete pipe provided such wells are constructed as follows:

1. The bore hole shall have a minimum diameter of six (6) inches larger than the outside diameter of the casing.

2. The annular space around the casing shall be filled with grout to a depth at least five feet below the static water level or twenty (20) feet below land surface, whichever is greater. The grout shall be placed in accordance with the requirements of rule 1200-4-9-.10(6)(d).

3. The annular space around the casing below the grout shall be completely filled with sand or gravel that has been disinfected with water containing a free-chlorine residual of at least 50 parts per million (ppm).

4. The sand or gravel material shall be composed of quartz, granite, or similar rock material and shall be clean, rounded, uniform, water-washed and free from clay, silt, or other deleterious material.

(b) The wellhead shall be completed in the same manner as required for other water-supply wells.

(10) Well Development. Prior to completion of a well for water supply, the driller shall take all steps necessary to:

(a) Remove any mud, drill cuttings, or other foreign matter from the entire depth of the well;

(b) Correct any damage to the aquifer that might have occurred during drilling; and

(c) Disinfect the well.

(11) Wellhead Completion

(a) The top of the casing shall be cut off smooth and level, be free from dents and cracks, and shall terminate at least six (6) inches above the land surface. All wells shall be capped with an approved well cap.

(b) Underground installations leading from the well shall employ a pitless adapter which does not require welding at the casing. Pitless units or adapters shall comply with the Water Systems Council's Pitless Adapter Division (PAD) PAS-1 (6th Ed., March 1987) and shall bear the PAD symbol of certification or shall otherwise have been approved by the Department.

(c) Pitless units or adapters shall be constructed and installed so as to prevent the entrance of contaminants into the well or potable water supply, conduct water from the well, protect the water from freezing, and provide access to water system parts within the well.

(d) Surface drainage shall be diverted away from the well head so that water is not allowed to stand around the casing.

(Rule 1200-4-9-.10, continued)

Authority: *T.C.A. §§4-5-201 et. seq. and 69-11-106.* ***Administrative History:*** *Original rule filed June 21, 1993; effective August 5, 1993. Amendment filed October 12, 1998; effective December 26, 1998.*

1200-4-9-.11 INSTALLATION OF PUMPS, FILTERS, AND WATER TREATMENT UNITS. Primary responsibility for compliance with the provisions set forth herein for the installation of water well pumps, filters and water treatment units rests with the installer of these devices.

(1) The capacity of the pump shall be consistent with the intended use and yield characteristics of the well.

(2) The pump and related equipment for the well shall be conveniently located to permit easy access and removal for repair and maintenance.

(3) The base plate of a pump placed directly over the well shall be designed to form a watertight seal with the well casing or pump foundation.

(4) In installations where the pump is not located directly over the well, the annular space between the casing and pump intake or discharge piping shall be closed with a watertight seal designed specifically for this purpose.

(5) The well shall be properly vented at the wellhead to allow for pressure changes within the well. The vent shall be screened to prevent entry of insects.

(6) Any suction line installed underground between the well and pump shall be surrounded by six (6) inches of impervious material such as cement, or encased in a larger pipe that is sealed at each end.

(7) All conduits, valves and other plumbing fixtures used to convey water from a water-supply well to any building or other outlet shall be installed in accordance with manufacturer's requirements.

(8) All pressure tanks shall be installed above ground unless the tank is specifically designated by the manufacturer for below ground burial.

(9) The electrical wiring and equipment used in connection with the installation of a water well pump shall:

(a) Meet underwriters specifications;

(b) Be installed in accordance with the National Electrical Code or local codes and ordinances if the latter are more restrictive;

(c) Be equipped with a fused or circuit breaker disconnect switch.

(d) Be served by an entirely separate circuit from other equipment.

(10) Water filters and water treatment units shall be installed and serviced to accommodate water quality problems as determined by physical, chemical or bacteriological evaluation or field test; and the function of the equipment shall achieve the results specified by the manufacturer. In servicing and installing treatment units the sanitation of the water supply shall be protected.

Authority: *T.C.A. §§4-5-201 et. seq. and 69-11-106.* ***Administrative History:*** *Original rule filed June 21, 1993; effective August 5, 1993.*

1200-4-9-.12 DISINFECTION OF WATER SUPPLY WELLS.

(1) All water wells shall be disinfected upon completion of construction, reworking, pump installation or repairs as follows:

(a) A chlorine solution shall be placed in the well in sufficient dosage to produce a chlorine residual of at least one hundred (100) parts per million (ppm) in the water standing in the well (see Tables C and D for the correct amount). A chlorine solution may be prepared by dissolving dry hypochlorite granules (trade names include HTH, Chlor-Tabs, etc.) in water or by liquid bleach (trade names include Clorox, Purex, etc). (CAUTION: When working with chlorine, persons should be in a well ventilated place. The powder or strong liquid should not come in contact with skin or clothing. Solutions are best handled in wood, plastic or crockery containers because metals are corroded by strong chlorine solutions).

TABLE C

QUANTITY OF DISINFECTANT REQUIRED TO PRODUCE A FREE CHLORINE RESIDUAL OF 100 PARTS PER MILLION (PPM) IN DRILLED WELLS.

Feet of Water	Liquid Bleach (Clorox, Purex, etc.) (5.25 % Chlorine)			Dry Granules (HTH, Clor-Tabs, etc.) (70% Chlorine)			Feet of Water
	Well Diameter			Well Diameter			
	4-inch	6-inch	8-inch	4-inch	6-inch	8-inch	
10	1/4 cup	1/2 cup	1 cup	1 tab.	2 tabs.	1/2 oz.	10
20	1/2 cup	1 cup	1 pt.	2 tabs.	4 tabs.	1 oz.	20
30	3/4 cup	1 1/2 cups	1 1/2 pts.	3 tabs.	1 oz.	1 1/2 oz.	30
40	1 cup	1 pt.	1 3/4 pts.	4 tabs.	1 1/4 ozs.	2 ozs.	40
50	1 1/4 cups	1 1/4 pts.	1 qt.	5 tabs.	1 1/2 ozs	2 1/2 ozs	50
60	1 1/3 cups	1 1/2 pts.	1 1/4 qts.	6 tabs.	1 3/4 ozs.	3 ozs.	60
70	1 1/2 cups	1 3/4 pts.	1 1/2 qts.	1 oz.	2 ozs.	3 1/2 ozs.	70
80	1 3/4 cups	1 qt.	1 3/4 qts.	1 oz.	2 1/4 ozs.	4 ozs.	80
90	1 pt.	1 1/4 qts.	2 qts.	1 1/4 ozs.	2 1/2 oz.	4 1/2 ozs.	90
100	1 1/4 pt.	1 1/4 qts.	2 1/4 qts.	1 1/4 ozs.	3 ozs	5 ozs.	100
120	1 1/3 pts.	1 1/2 qts.	2 1/2 qts.	1 1/2 ozs.	3 1/2 ozs.	6 ozs.	120
140	1 1/2 pts.	1 3/4 qts.	3 qts.	1 3/4 ozs.	4 ozs.	7 ozs.	140
160	1 3/4 pts.	2 qts.	3 1/2 qts.	2 ozs.	4 1/2 ozs.	1/2 lbs.	160
180	1 qt.	2 1/4 qts.	1 gal.	2 1/4 ozs.	5 ozs.	2/3 lbs.	180
200	1 1/4 qts.	2 1/2 qts.	1 1/4 gal.	2 1/2 ozs.	6 ozs.	3/4 lbs.	200
250	1 1/2 qts.	3 qts.	1 1/2 gals.	3 1/4 ozs.	1/2 lb.	1 lbs.	250
300	2 qts.	1 gal.	1 3/4 gals.	5 ozs.	2/3 lb.	1 lbs.	300
400	2 1/2 qts.	1 1/4 gal.	2 1/4 gals.	6 1/4 ozs.	3/4 lbs.	1 1/2 lbs.	400
500	2 3/4 qts.	1 1/2 gal.	2 3/4 gals.		1 lbs.	2 lbs.	500

Measures:
2 cups = 1 pint (pt)
2 pints = 1 quart (qt)
4 quarts = 1 gallon (gal)
7 tablets = 1 ounce (oz)
8 ounces = 1/2 pound (lb)
16 ounces = 1 pound (lb)

Equations for calculating amount of disinfectant required to chlorinate drilled wells with diameters larger than 8 inches:

Pints of liquid bleach = $D^2 h \div 10$

Ounces of dry granules = $D^2 h \div 9$

(Rule 1200-4-9-.12, continued)

where: D = Diameter of well in feet
h = height of water above bottom of well in feet.

TABLE D

QUANTITY OF DISINFECTANT NEEDED TO PRODUCE A FREE CHLORINE RESIDUAL OF 100 PARTS PER MILLION (PPM) IN DUG OR BORED WELLS

Feet of Water	Liquid Bleach (5.25% Chlorine) Well Diameter in feet				Dry granules (70% chlorine) Well Diameter in feet			
	2 ½	3	4	5	2 1/2	3	4	5
1	1 1/4 cups	1 pt	1 Qt	1 1/4 qts	5 tabs	1 oz	2 ozs	3 ozs
2	1 1/4 qts	1 qt	1 1/2 qts	2 1/2 qts	1 1/2 ozs	2 ozs	4 ozs	6 ozs
3	1 qt	1 1/2 qts	2 1/4 qts	3 1/2 qts	2 1/4 ozs	3 ozs	6 ozs	9 ozs
4	1 1/4 qts	2 qts	3 qts	5 qts	3 ozs	4 ozs	1/2 lb	3/4 lb
5	1 1/2 qts	2 1/4 qts	4 qts	1 1/2 gals	4 ozs	5 ozs	3/4 lb	1 lb
10	3 qts	1 1/4 gals	2 gals	3 gals	7 ozs	1/2 lb	1 1/2 lbs	2 lbs
15	1 gal	1 3/4 gals	3 gals	4 1/2 gals	3/4 lb	1 lb	2 lb	3 lbs
20	1 1/2 gals	2 1/4 gals	4 gals	6 gals	1 lb	1 1/2 lbs	2 1/2 lbs	3 1/2 lbs

Equations for calculating amounts of chlorine needed to disinfect dug or bored wells.

Pints of liquid bleach $= D^2h) 10$

Ounces of dry granules $= D^2h) 9$

where: D = diameter of well in feet
h = height of water above bottom of well in feet.

(b) Place the required amount of liquid bleach or dry granules in the well by one of the following methods:

1. Dry granules or tablets may be dropped in the top of the well and allowed to settle to the bottom; or

2. Liquid bleach may be mixed with water and poured in the top of the well and allowed to settle to the bottom.

(c) Agitate the water in the well to insure thorough dispersion of the chlorine throughout the entire length of the well.

(Rule 1200-4-9-.12, continued)

(d) The well casing, pump column and any other equipment above the water level in the well, shall be thoroughly rinsed with the chlorine solution as a part of the disinfecting process.

(e) The chlorine treated water shall stand in the well for a period not less than twelve (12) hours. The well shall, thereafter, be pumped until the odor of the chlorine is no longer detectable.

Authority: *T.C.A. §§4-5-201 et. seq. and 69-11-106.* ***Administrative History:*** *Original rule filed June 21, 1993; effective August 5, 1993.*

1200-4-9-.13 REPAIR OF WATER WELLS.

(1) All materials used in the replacement or repair of any water well shall meet the requirements for a new installation.

(2) Plastic pipe approved by the National Sanitation Foundation (NSF) and rated at 160 psi (SDR = 26) may be used for liner casing. The liner casing shall be installed with centering guides to insure proper centering in the well and the annular space around the liner casing shall be completely sealed at both ends to repel the inflow of extraneous material from the lined interval.

(3) Repairs to wells completed with the top of the well casing terminating below ground shall include extending the well casing above land surface in accordance with rule 1200-4-9-.10(5)(a).

Authority: *T.C.A. §§4-5-201 et. seq. and 69-11-106.* ***Administrative History:*** *Original rule filed June 21, 1993; effective August 5, 1993.*

1200-4-9-.14 WELL REGISTRATION - IDENTIFICATION.

(1) Each water well constructed or reconstructed shall be equipped before the drill rig leaves the site with an identification tag or decal bearing a registration number. The tag and registration number shall be supplied by the Department.

(2) The identification tag or decal shall be securely attached to the well casing or other appurtenance where it is readily visible.

(3) The identification tag or decal shall not be removed from the well unless otherwise approved by the Department.

(4) The registration number shall be recorded on the well completion report to be submitted by the driller to the Department.

Authority: *T.C.A. §§4-5-201 et. seq. and 69-11-106.* ***Administrative History:*** *Original rule filed June 21, 1993; effective August 5, 1993. Amendment filed October 12, 1998; effective December 26, 1998.*

1200-4-9-.15 DATA AND RECORDS REQUIRED.

(1) A well completion report shall be submitted to the Department on a form provided or approved by the Department within thirty (30) days after completion of the construction or reconstruction of each water well.

(2) The report shall be true and accurate. The report shall include as a minimum the following accurate information about the well. Footage shall be accurate to the nearest foot of measurement:

(a) Name and address of the person for whom the well was drilled;

(Rule 1200-4-9-.15, continued)

(b) The location of the well as denoted by county, street address and road name;

(c) The location of the well as denoted by driller map number coordinate or latitude and longitude of the well;

(d) Proposed use of the well ;

(e) The date completed for each well;

(f) The "log" of the well;

(g) The depth, diameter and general specifications for the well including;

1. Casing lengths used, type, diameter, wall thickness or SDR rating;

2. Liners used, location ,type diameter, wall thickness or SDR rating;

3. Bottom depth of casing, and depth of screen or slotted pipe;

4. Type backfill material used and location of backfill, and location of packers;

5. Static water level, depth to bedrock, (if encountered) for bedrock wells only;

6. Estimated yield of well in gallons per minute for bedrock wells only;

7. Water bearing zones encountered in excess of one gallon per minute for bedrock wells only;

8. General water quality;

(h) Licensed driller's name and contractor identification number;

(i) The well registration number;

(j) Information on well head completion, i.e. well cap, well disinfection, confirmation by the driller that septic tank and field lines are located fifty feet or greater from well.

(3) The original report shall be signed by the licensee and submitted to the Director. The licensed driller shall maintain a copy of each report and fee payment submitted for five years.

Authority: *T.C.A. §§4-5-201 et. seq. and 69-11-106.* ***Administrative History:*** *Original rule filed June 21, 1993; effective August 5, 1993. Amendment filed October 12, 1998; effective December 26, 1998.*

1200-4-9-.16 WELL ABANDONMENT.

(1) The driller shall backfill and abandon any newly drilled well in which casing has not been installed or from which casing has been removed, within thirty (30) days after the drill rig leaves the site. The driller shall take all steps necessary to maintain safety around the site until the abandonment process is completed. Prior to abandoning any such well, the driller shall:

(a) Remove all equipment or material that may obstruct access to the bottom of the well,

(b) Check the entire depth of the well for obstructions that may interfere with sealing operations and remove them, and

(c) Thoroughly chlorinate the well prior to sealing by the addition of sufficient quantities of liquid bleach or dry hypochlorite granules to produce a free chlorine residual of 25 parts per million (ppm).

(2) Except as provided in paragraphs (3), (4), and (5) well plugging and abandonment shall be accomplished by the following methods:

(a) For uncased wells, a cement grout or bentonite as defined in Rule 1200-4-9-.16 (2) (c) shall be placed in the well bore from land surface to a minimum of twenty-five (25) feet below land surface. The well bore below twenty-five (25) feet below land surface shall be filled with either bentonite, cement grout, clean crushed stone one half inch in diameter or less, well cuttings, puddled clay, sand or combined mixture of any of these listed materials.

(b) For water wells with casing, a surface plug consisting of either cement grout or bentonite as defined in Rule 1200-4-9-.16 (2) (c) shall be placed in the well bore from land surface to a minimum of five (5) feet below land surface. An additional seal of cement grout or bentonite as defined in Rule 1200-4-9-.16 (2) (c) shall also be placed in the well bore for a minimum length of ten feet. The top of this ten foot seal shall either be located either within twenty feet below the bottom of the casing or at the top of the well screen or perforated pipe. The remaining well bore or casing shall be backfilled with either bentonite, cement grout, clean crushed stone one half inch in diameter or less, well cuttings, puddled clay, sand, or combined mixture of any of these listed materials. Surface casing may be terminated below land surface provided that the upper surface plug of five feet is maintained.

(c) The grout material used in the plugging and abandonment of a water well shall consist of a mixture of Portland Class A cement or quick setting cement in a ratio of not over six (6.0) gallons of water per ninety-four (94) pound sack of cement, or a high solids bentonite grout with a minimum of 20% solids and a weight of no less than nine and two tenths (9.2) pounds per gallon as measured by a standard mud balance. The use of bentonite, in chip or tablet form, ranging in size from one-quarter inch (1/4") to three-quarters of an inch (3/4) will be allowed as an alternate seal to slurry grouting. The bentonite shall be mixed and applied in accordance with the manufacturer's recommendations. The use of low solids bentonite drilling clay (designed for use as a drilling fluid to form a filter cake on the side walls of the borehole and to increase viscosity of water) is prohibited for use as a grout or sealing material except as an additive. Only bentonite grout, bentonite tablets, or bentonite chips, approved by the National Sanitation Foundation (NSF) or American National Standards Institute (ANSI) certified parties as meeting NSF product standard 60 or 61 shall be approved by the Department as appropriate grouting or sealing material.

(d) Placement of the backfill material shall be done in such a way that there are no bridges or gaps in the well bore. The top of the backfill material shall remain level with land surface.

(3) Wells extending into more than one aquifer shall be filled and sealed in such a way that exchange of water from one aquifer to another is prevented.

(4) The sealing of flowing wells shall be accomplished only after the wells have been treated to reduce the flow to zero. This may be accomplished by introducing high specific gravity fluids which are approved for use in potable water systems into the bottom of the well bore and continuing until the flow ceases.

(5) The driller may submit a written petition for an alternative method of well abandonment. Any alternate method of filling and sealing a well shall be submitted to the Director for review and written approval prior to sealing a well by such method. In an emergency or in exceptional instances, the

(Rule 1200-4-9-.16, continued)

Department will respond to a verbal request provided the applicant submits a written application within ten (10) days of the verbal application.

Authority: *T.C.A. §§4-5-201 et. seq. and 69-11-106.* ***Administrative History:*** *Original rule filed October 12, 1998; effective December 26, 1998.*